Disappearing Reeds on Chongming Island: An Environmental Microhistory of Chinese Eco-Development

Abstract

This paper critically examines current ecological development planning and practice in China through an environmental microhistory approach. By tracing the gradual disappearance of an indigenous plant—the common reed (*Phragmites australis*)—on Chongming Island in Shanghai, which is known for the grand Eco-Islands development plan, this paper reveals the paradox of ecological destruction through eco-development in China. Based on data collected from archives, through oral history and through on-site fieldwork, we have reconstructed and analysed the transformation of Chongming Island's reed ecology over time. Our research documents the historical importance of reeds to Chongming culture and identity. The transformation of the reed landscape mirrors, we argue, broader environmental and social transformations on the island. The near extinction of the once abundant reed in the coastal wetlands due to massive land reclamation projects for the purpose of industrialisation and urbanisation is a reflection of the prevailing pursuit for economic growth. Land reclamation projects in the early 2000s were facilitated by the planting of an invasive grass that replaced reeds and other native wetland plants. Ironically, the invasive grass served to legitimise continuous land reclamation as part of Chongming's eco-development. Moreover, reeds that grew by the rivers and constituted a central part of local livelihoods were gradually wiped out as a result of a series of river regulation projects under the eco-development. Our research reveals that the current ecological agenda has privileged modern engineering solutions and aesthetics while largely ignoring local traditional knowledge. The case of Chongming delivers a sobering message that well-intentioned ecological initiatives can in fact have disastrous effects if the local environment, its ecological features, cultural characteristics, and historical and social contexts are not fully considered. Overall, this paper pioneers an environmental microhistory approach in evaluating contemporary urban ecological initiatives and contributes methodological and empirical insights to advance Chinese eco-developments.

Key words: *Environmental Microhistory; Eco-development; Reeds; Chongming Island; China*

Highlights

- The gradual disappearance of reeds reflects the environmental and social changes of the Chongming Island.
- Ecological developments could lead to ecological destruction if the local environment and historical and social contexts are not fully considered.
- Environmental microhistory is a useful approach to evaluate the planning and practices of eco-development projects.

1. Introduction

As awareness of the challenges of climate change and environmental degradation has grown since the late 1990s, ideas of sustainability have increasingly been embedded into multiple urban and rural development initiatives across the globe (De Jong et al., 2015; Shao, 2015). Since the turn of the century, the Chinese government has promoted an ideology focused on the idea of an "Ecological Civilisation," which emphasises environmental improvement and sustainable development, with the aim of developing a "harmonious society." The concept of an "Ecological Civilisation" is abstract, functioning as an environmental-political goal of the Communist Party of China (CPC). Its materialisation and realisation depend on a series of detailed laws, plans, regulations, subsidies, and projects that have been introduced and implemented across the nation. Alongside contributing to the strengthening of environmental legislation and regulation (Zheng, 2008), the pursuit of the concept of an Ecological Civilisation has prompted a vast number of eco-projects implemented on diverse scales across China, ranging from a province or a city to a rural county or village (Chen, 2018; De Jong et al., 2016; T. Song, 2016). These eco-projects, involving either minor retrofits or the large-scale development of new towns and cities, aim to achieve a win-win outcome for both development and the environment (Shao, 2015; Xie et al., 2019a).

Although mostly still under construction, the vast number of eco-developments in China have distinct features that differentiate them from Western practices. They are typically characterised by a top-down mechanism in which the state plays a pivotal or sole role (Flynn et al., 2016; Yu, 2014) and are driven by an ecological modernisation agenda that claims that the economy and the environment can thrive together, while in reality "technocratic" approaches to sustainability are privileged (De Jong et al., 2016; Neo and Pow, 2015; Caprotti et al., 2015). Chinese eco-developments are, in fact, underscored by a pro-growth ideology closely linked to urbanisation, urban entrepreneurialism, and green capitalism, as exemplified in mainstream new town development patterns (Chang & Sheppard, 2013; Chen, 2013 and 2018; Chien, 2013; Caprotti et al., 2015; Xie et al., 2020). Recently, Pow (2018) pointed out that a form of aesthetic governmentality has been deployed in eco-cities and other eco-developments in China. Visual codes and eco-aesthetic norms are now emphasised to build an "ecologically advanced" urban environment. The emergence of eco-aesthetic governmentality signals a shift from a dominant techno-scientific foundation of planning towards a more ecological form of development. It nevertheless still represents a top-down approach to environmental management in China, which privileges an anthropocentric view of nature vis-a-vis a deeper understanding of more-than-human ecologies. As a result, China's eco-developments are often criticised for failing to consider local conditions and ecologies, as evidenced by their ill-conceived locations, with many constructed in either environmentally sensitive areas or on arable land (Yu, 2014; Joss & Molella, 2013). They are also

criticised for their inability to generate overall environmental benefits and resolve challenges associated with social inequality. In some cases, social inequalities are even exacerbated by the development of eco-projects (Xie et al., 2019a).

There is plenty of research focusing on specific aspects of eco-development projects in China. These include the founding principles underlying eco-initiatives (Chien, 2013; Pow & Neo, 2013; Joss & Molella, 2013), different/shifting modes of development (Xie et al., 2020; Pow, 2018), planning and design processes (De Jong et al., 2013a; 2013b), implementation challenges (De Jong et al., 2016), and the dynamics of knowledge transfer between China and its foreign partners (Hult, 2015; Pow & Neo, 2015), as well as between projects within China (Chang, 2017). These existing studies help to contextualise eco-developments in China at the same time as they ignore a number of important existing contextual factors. Firstly, most research is constrained through its focus on a limited time span. The vast majority of research focuses on the inception of a particular eco-project and then goes on to analyse and evaluate its immediate socio-economic and ecological impacts. This type of research typically ignores the state of the environment and its ecological processes prior to development, as well the socio-ecological dynamics that have impacted on the site over time (especially before the development of the eco-project). Secondly, as China's eco-projects are primarily launched by governments, existing research tends to adopt a top-down analysis, drawing on official documents and their interpretation by state actors with respect to the outcomes and achievements of the eco-project. As a result, the impact of these ecological initiatives on local environments and communities, and in particular how local people perceive the changes brought about by eco-developments, remains largely understudied (exceptions can be seen in Xie et al., 2019a, 2019b; Chang, 2019).

This paper contributes to this body of research arguing that an environmental microhistory approach offers a fruitful perspective for understanding eco-development projects in China. Broadly, the discipline of environmental history is concerned with the impact of human actions on 'natural' environments and ecological systems and their evolution over time (Mauch et al., 2006; Mauch, 2013). Through a historical examination of the interaction between humans and nature, environmental history pays close attention to the causes, contingencies, and context of environmental change (Isenberg, 2014). Chinese environmental historians, most prominently Bao Maohong, have emphasised the crucial role of environmental history in the promotion of sustainable development (Bao, 2004). In this respect, eco-development projects and environmental history share common ground. Whilst eco-planners have been notoriously blind to past developments, environmental history provides an understanding of why and how landscapes and ecologies, flora and fauna, as well as the livelihoods of local populations, have changed throughout time. The knowledge that past societies often managed their relationship with the environment in a more sustainable way than in the current

day can help us better understand past and future environmental challenges. Beyond this, it can also provide insight into potential alternative pathways for eco-projects, with a view towards more locally appropriate ecological development.

To illustrate the benefits of using environmental history to examine contemporary eco-development projects, we explore the eco-development of Chongming Island in Shanghai, China. Chongming—the third largest island in China—has been a pilot project of ecological development. In 1996, Chongming County was selected as one of the pilot projects of the National Ecological Demonstration Zone (MEP, 2002). In 2005, the high-profile Dongtan Eco-City project was launched on the eastern tip of the island, which claimed to be the world's first purpose-built eco-city (Arup, 2008; Head & Lawrence, 2008). Following this, in 2006, the Shanghai Municipal Government (SMG) issued the "General Plan for Chongming's Three Islands," announcing its decision to develop Chongming Island and the two small neighbouring islands (Changxing and Hengsha) in to "Eco-Islands" (SMG, 2006). More recently, a grand plan was announced by the SMG to develop Chongming into a world-class eco-island (SMG, 2016). With more than two decades of eco-development continuing up until the current day, Chongming Island has undergone significant changes in terms of its environment and society. While state-led environmental construction efforts are highly visible (as a result of the uniformly landscaped riverbanks and vast patches of woodland emerging on the island, for example), changes occurring at a microscale, such as the gradual disappearance of reeds—a highly productive native wetland plant—are rarely noticed by government officers, media reporters, and visitors and tourists to the island. Nevertheless, during our interviews, local residents on Chongming frequently mentioned and even bemoaned the significant decrease of the reed landscape on the island. Questions thus arise about what caused such a dramatic loss of reeds and how the changing reed ecology relates to the socio-ecological transformation of Chongming. To answer these questions, we adopt an environmental microhistory perspective, tracing the history of reeds on Chongming in order to explore localised ecological changes affecting the reeds and the role of reeds in Chongming's economy, society, and culture across time. Ultimately, this research demonstrates how environmental (micro)history can help unravel local environmental transformations before and during eco-development projects, enabling a comprehensive evaluation of ongoing eco-developments in China. Such an approach seeks to avoid the pitfalls associated with human-centred narratives based solely on the interpretation of official government documents.

This paper is divided into four sections. Section two presents a literature review exploring the nexus between environmental microhistory and Chinese eco-development studies, while section three presents a detailed justification for the use of Chongming Island as a case study and the adoption of the reed as the main subject of research. This section also elaborates on the research methodology

employed throughout the study. In section four, the story of disappearing reeds on Chongming Island is explored from an environmental microhistory point of view. Altogether, this paper highlights the paradox of ecological destruction not *despite* of but *through* eco-development. To conclude, section five summarises the key findings and reflects on the implications of environmental microhistory as a research framework for assessing ecological developments.

2. Environmental microhistory and contemporary eco-developments

Based on the assumption that environmental changes usually take place over a longer period of time than social changes, environmental historians focus predominantly on *longue durée* processes, such as geological, biological, and evolutionary changes, as useful bases for elaborating on the human past (Rosenthal, 2017). However, this view has been challenged in recent times due to the development of a better understanding of ecological dynamics and of the effects of anthropogenic activities on the health and stability of ecological systems. With environmental change now occurring at an accelerated rate, ecological tipping points are at risk of being reached, leading to systemic imbalances in earth's ecology and climate with potentially disastrous outcomes (Franco, 2018). This realisation combined with reinvigorated interest in local issues has led to approaches that combine environmental history with microhistory, leading over the last two decades to the development of the new sub-discipline of environmental microhistory (Engelbrecht, 2019; Franco, 2018).

Microhistory has been most succinctly defined as "the intensive historical investigation of a relatively well-defined smaller object," such as a single event, a village community, or a group of families or individuals (Szijártó, 2013: 4). Moreover, by studying small objects or small places, microhistory aspires to probe larger historical questions (Joyner, 1999; Szijártó, 2013). A fundamental characteristic of microhistory is therefore its use of synecdoche, or examining "the ocean in a drop" (Kisantal, 2015: 513). The focus of microhistory shifts from a macroscopic view and long-term observation to individuals and groups in a specific time and place in history (Zhao, 2015). As aptly described by Worster (1988: 136), microhistory provides environmental history with "a focus and process." Compared to microhistory, which is generally considered to be human-centred (Sandwell, 2009) with the environment a mere backdrop to social and political events (Zhou, 2006), environmental microhistory focuses on the relationship between humans and nature (Engelbrecht, 2019, p12), giving equal weight to both human action and environmental processes. As advocated by Engelbrecht (2019, p.12), environmental microhistory can and "needs to play an increasingly bigger role [in] identifying, researching, analysing and reporting on the *micro* in the *macro* context (emphasis in original)."

Through the analysis of specific phenomena, such as regional weather patterns, polluted river basins, or bad agricultural harvests, environmental microhistory possesses a remarkable capacity to link the

micro with the macro, yielding insights that can inform contemporary debate on environment and development (Arndt, 2016). Existing studies that adopt an environmental microhistory perspective commonly focus on rather complex relationships between people and their immediate physical surroundings from a local or individual standpoint, which often involves a limited temporal and spatial scale (Franco, 2018; Sandwell, 2009; Schlesinger, 2018). For example, Rosenthal's (2017) narrative of a tropical cyclone that struck Apia, the capital of Samoa, on March 16, 1889, during a period of 24 hours, has assisted in revealing the dynamics of territorial disputes between colonial Western powers and native peoples; while Bonnell's (2010) research on human interactions with Toronto's Don River Valley from the late eighteenth century to the present, focusing on a period of intense urbanisation and industrialisation (1880–1940), has helped to inform current plans to "renaturalise" the river mouth. These initiatives illustrate the significance of environmental microhistory and its relevance to current decision-making and policy development (Franco, 2018).

However, Hayes' (2010) and Yeh's (2009a) work on the transformation of wetlands in Western China is more immediately relevant to the present study. By investigating the environmental transformation of the Zoige grasslands on the eastern edge of the Tibetan Plateau from 1949 to 2005, Hayes (2010) reveals how state-led development projects aiming to "improve" local conditions on the grasslands and wetlands have led to both positive and negative outcomes for local Tibetan residents. Up until the 1980s these residents had little or no say in modernisation efforts. Similarly, Yeh (2009a) traces a series of environmental projects enacted on Lhasa's Lhalu wetland from the 1950s to the present. Her paper combines historical analysis with a political ecology approach, as it reveals that competing nationalist narratives were at the core of a Chinese-Tibetan dispute about environmental conservation. According to Yeh, in foregrounding nationalist interpretations, both the Chinese and the exiled Tibetan narratives erase local historical agency. Tibetans argued that their care for the environment was rooted in Buddhist beliefs about harmony between living and nonliving entities and in traditional knowledge of sustainability. In reality however, Tibetans were never simply "close to nature". Their relationship with the Lhalu wetland was deeply social. The marshes were managed and its grasses used to feed livestock. Tibetan claims that the Chinese had destroyed indigenous naturalisms was a distortion of history, according to Yeh. On the other hand, Chinese claims, that their (expensive and expansive) modernization projects eliminated backward feudal understandings of nature and established an enlightened stewardship of nature, leaves out central parts of the story as well. The Chinese in Tibet manipulated the environment, promoted both preservation and urbanization and turned a historical landscape of low-key production into an environment of national and international consumption for tourism. The "pristine" nature that Chinese propaganda would showcase was the result of massive intervention in nature. Conservation efforts that built nature reserves (and kept people out) were part

of a political strategy and agenda, according to Yeh, that promoted China's role as a player in ecological civilization while at the same time legitimizing sovereignty over Tibet. Both Hayes' (2010) and Yeh's (2009a) study reveal the impact of political-economic pursuits on the environment in a specific region and over a specified period of time, as they explore the interaction between human activities and environmental change.

As Ecological Civilization in China claims to construct a society where human and nature can thrive together, an environmental microhistory study can help to examine how such a political agenda plays out on the ground, affecting local ecologies and communities over time. However, even in a confined area (such as an eco-development site), the environment is a complicated system, which poses distinct challenges to in-depth historical analyses. Here, we draw methodological insights from the Chinese interpretation of environmental microhistory, which advocates going into detail by focusing on a specific plant or animal species in order to gain a better understanding of the broader environmental and societal changes. The discussion of the "micro shift" in environmental history has emerged in Chinese-language literature in recent years (Zhao, 2015). The concept—*weiguan huanjing shi* (micro environmental history)—is defined by Zhao and Ma (2017) as "a branch of environmental history that uses the theory of history and ecology to examine the specific and delicate interaction between humans and nature." In their interpretation, the timespan needs not necessarily be reduced in environmental microhistory, but the focus should be on a smaller spatial scale. Zhao and Ma (2017) also advocate focusing on specific ecologies, primarily fauna and flora: on animal species, such as the Manchurian Tiger, or on plants like bamboo, or reeds (as in our case study).

More so than European or North American environmental scholars, Chinese environmental historians were inspired by research that explored plant ecologies (e.g. bamboo, citrus, and lynches), or animals (e.g., Chinese alligators, peacocks, parrots, Asian elephants, giant pandas, and gibbons), often going back to ancient China (e.g., Wen, 1995).[1] When the discipline of environmental history took off in China in the late 1990s (McNeill, 1998), scholars integrated changing ecologies into their studies, for instance by tracing the geographical and historical distribution of wild animals, such as elephants, tigers, rhinos, bears, and deer (Cao, 2010; Elvin, 2004; Hou et al., 2014; Lan, 1995a; Lander and Brunson, 2018; Liu and Meng, 2006; L. Wang, 2002), as well as economic crops, such as millet, wheat, rice, mulberry, corn, sweet potato, and Phoebe Nees (Cao, 1990; Han, 1992a & 1992b; Hua, 1990 & 1992; Lan, 1995b). More recently, in his monograph *Environment and Civilization of Human-Bamboo Symbiosis in China: A Permanent Green History,* Wang (2013) investigates the wide application and use of bamboo in military affairs, water conservancy, the built environment, transportation, culture and entertainment, and as

[1] For another example cp. He Yeheng's research on mammals in China (He, 1993 & 1996).

food in ancient China. Wang examines how changes in society affect bamboo ecology and how changing bamboo resources influence people's environments. His study makes a promising contribution to the field of environmental microhistory by examining the ecology of a plant species that is closely linked to people's everyday lives (Zhao, 2015).

"Ecology" ("shengtai" in Chinese), and "environment" ("huanjing"), are closely correlated concepts. In contrast to English and many western languages, the two terms form a semantic unit – they are distinct from each other, but often used in conjunction. Thus, for instance the Environmental Ministry of the State Council of the PRC is called Ministry of Ecology and Environment ("shengtia huanjing bu"). It is in charge of monitoring ecological processes and of protecting human livelihoods, environments, and development. The term "ecology" ("shengtai") lays particular stress on the relationship between organisms in a specific ecosystem. However, it takes the surroundings of these ecologies into account as well. "Environment", in contrast, is a complementary term that refers to the sum of all factors around a certain (in most cases: human) subject. Environment ("huanjing") is typically understood to be the external carrier of human life or the external world surrounding human beings. The term ecological history is often used if the focus of a study is primarily on natural processes as they relate to human livelihoods. In contrast, environmental history highlights human surroundings as spaces of natural resources and prerequisites for the support of human life and society.

In our study on the Chongming Eco-Islands project, we put the reed (a typical object of ecological history) at center-stage but our focus is on the human transformation of nature and of rural communities over time. Because the area of our focus is small, we adopt the term microhistory, and because of the many cultural and political implications we use the word environmental history. But even as we use the term environmental microhistory (a term that sounds appropriate in English), we think of our study as an ecological-environmental study - one that combines "shengtai" and "huanjing".

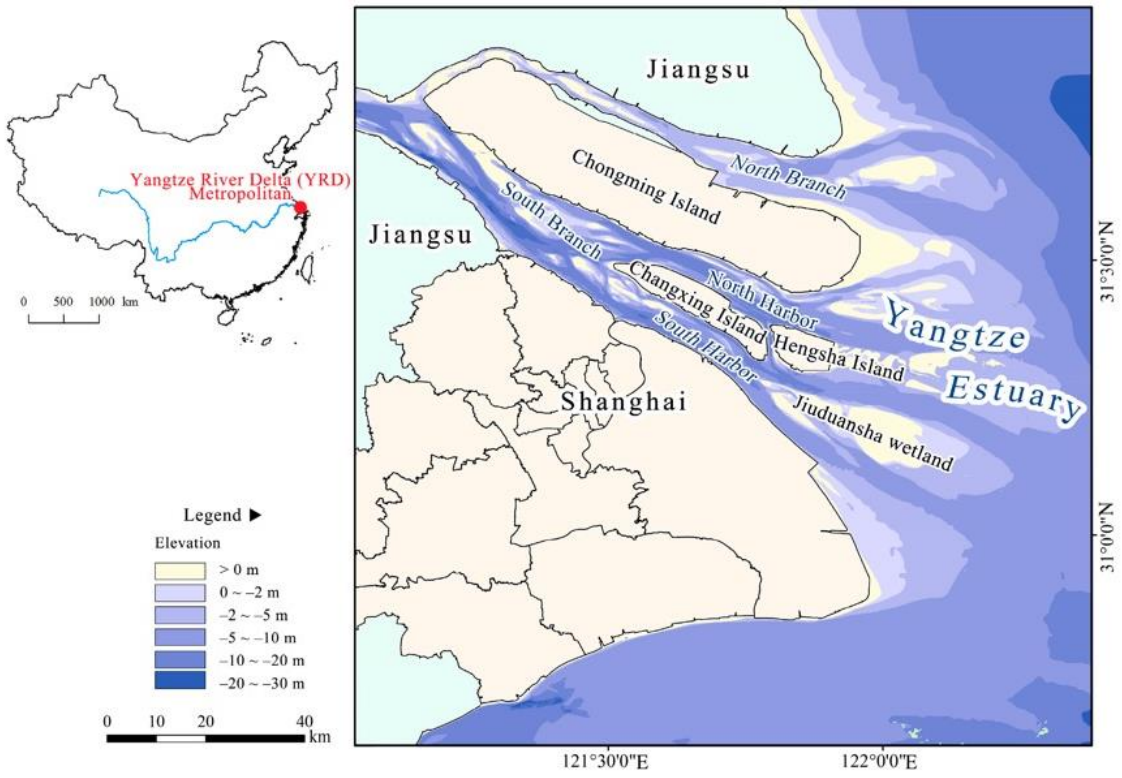
Altogether, the concept of environmental microhistory has great potential as it provides us with an opportunity to analyse interactions between nature and society in great depth. Interestingly, environmental microhistory approaches have not been applied to the study of recent eco-developments in China. A lack of research concerning contemporary issues is also evident in existing Chinese environmental history scholarship (McNeill, 2003; L. Wang, 2010), perhaps in part for political reasons (Bao, 2004). Acknowledging the importance of a historical perspective, as well as the benefits of focusing on a specific plant species (in this case) for understanding broader ecological and social changes, we adopt an environmental microhistory approach to critically evaluate the current burgeoning "Ecological Civilisation" guided eco-developments in China through an investigation of

changing reed ecology on Chongming Island. The following sections provide a detailed outline of our methodology and findings.

3. Methodology and case study

We ground our study on Chongming Island on the eastern coast of China. Chongming Island (121° 09′ 30″ ~ 121° 54′ 00″ E, 31° 27′ 30″ ~31° 51′ 15″ N) is located in the estuary of the Yangtze River in the north of Shanghai (Figure 1). It is shaped and strongly influenced by the dynamics of suspended sediment delivery, which are in turn affected by both river discharge and tidal characteristics (Wu et al., 2019). With an area of 1,267 square kilometres, it is the largest alluvial island in the world. The island is flat and characterised by low elevation because 90% of its area lies between 3.47 and 5.07 m annual mean sea level (mean 4.12 m) (Wu et al., 2019). As mentioned above, Chongming is one of China's pioneering eco-development sites endowed with high level political patronage. Chongming Island is a well-defined area with diverse landscapes ranging from wetlands, crop fields, forests, and urban areas. During its nearly 1,400 years of recorded history, Chongming has nurtured a rich culture, and today houses nearly 510,000 residents (Chongming Statistics Bureau, 2017). Overall, Chongming serves as an intriguing site for investigating changing human-nature interactions before and during an eco-development, which can further inform the examination of current practices and impacts of eco-developments in China.

Figure 1. Location of Chongming Island



Source: Wu, Chen and Meadows (2019).

Reed (*Phragmites australis*) is one of the most common wetland plants in the world. Its rootstock is well-developed and intertwined, and the plants usually grow to a height of 2.5 to 3.5 metres. It is a highly productive grass that can be found at almost any wetland site, such as on the shores of lakes, riverbanks, fens, and marshes (Köbbing et al., 2013). It grows wildly, and can even thrive in disturbed soils, as found on roadsides, in dredged areas, polluted landscapes, and in nutrient-rich peatlands. Historical records show that reeds have existed on Chongming since its formation and that they have thrived for more than a thousand years. Together with other wetland plants, reeds have served as green buffers protecting the island's shores and as habitats harbouring aquatic creatures and birds. Reeds also helped to mediate the micro-climate, purifying water and conserving the soil (Mao, Gong & Zhang, 2017; Chen et al., 2002). Moreover, they have been an integral part of local daily life, economy, ecology, and culture throughout history. However, today, it is difficult to find reeds on Chongming. Apart from two constructed wetlands—the Dongtan Wetland Park and the Xisha Wetland Park (Figure 2)—only sporadic reed fields can be found. Drawing on an environmental microhistory perspective, we trace reeds throughout Chongming's history to explore the causes of this ecological tragedy and, more specifically, to understand how current eco-developments have influenced the changes that have taken place. To achieve this, we collected extensive data, including historical records

and documents, oral interviews with a multiplicity of different groups of people concerned about the reed's disappearance, and empirical observations from the field.

Figure 2. Reed marshes in Chongming Xisha Wetland Park

Source: authors.

Written records provide the main set of primary sources for historians. With a long history, a relatively large number of written sources were available for Chongming. These included genealogies as well as articles from local gazetteers and county chorography (known as *Xianzhi*)—a distinct genre of Chinese historiography. Produced by the imperial, provincial, and local gentry and bureaucracy, county chorography provides abundant information on local social, economic, political, and to some extent environmental conditions, making it a good source for reconstructing the history of specific places (McNeill, 1998). The compilation of Chongming County chorography began during the Yuan Dynasty. It appeared in 11 editions before the establishment of the PRC in 1949, and 7 of them have survived through time. A number of local official records also provide additional information. These include Chongming County Land *(Chongming Xiangtu Zhilue)* published in 1924, Chongming County Water Conservancy Chronicles *(Chongming Xian Shuili Zhi)* published in 1987, and Chongming Almanac *(Chongming Nianjian)* published annually since 1989. Altogether, these chorographical records

document the historical evolution of Chongming's natural geography, social conditions, ecology, economy, and culture.

As official histories are typically more concerned with governance, the formulaic county chorography often has limited information about environmental and landscape change. As a result, there are not a lot of sources that document local plant species and the surrounding ecology, or indeed the history of reeds. We therefore base our research on more cultural sources, including the folk literature of Chongming, which often depicts not only local livelihoods, culture, and customs but also the landscape and environment. While some elements in folk literature may be more imagined than real, the general description of social life appears to be quite accurate (Zhao & Ma, 2017). Furthermore, due to the significant role played by the state in managing the local environment (especially since the establishment of the PRC), government documents, such as policies, plans, statistics, and reports are significant references for understanding local societal and environmental change. This is supplemented by abundant academic literature and media reports on Chongming, especially since the initiation of the Eco-Islands plan.

Besides archival research, we have also unearthed information and collected data from interviews with local people, as oral history arguably "add[s] a human dimension to otherwise dry chronologies" (Menzies, 1998: 112). As local people are dependent upon and strongly attached to the environment, they are often the most knowledgeable sources for local histories. Observations, memories, and the perceptions of local people yield useful insights into environmental changes on the island. From November 2016 to September 2018, we conducted nine field visits to Chongming, with an average duration of six days each. During the field visits, we conducted 28 semi-structured interviews with local residents, predominantly with village elders. Three informal focus group meetings with villagers from Hongqiao Village were held, with the first meeting taking place on March 31, 2018, which included three males and one female elder (all above 60 years old). The following two meetings were held on September 12, 2018. These had three males and two female elders and four males and three female elders in attendance, respectively. This was further complemented by in-depth interviews with 6 planning professionals, 6 academic experts, 3 local cadres, and 2 representatives from local enterprises on Chongming, who were either closely involved in the Chongming Eco-Islands development or who had conducted research on the island. Based on data collected from textual sources, interviews, and field surveys, the story of the reeds on Chongming Island was pieced together, enabling an environmental microhistory examination of the eco-developments that took place on the island.

4. Disappearing reeds: An ecological microhistory of Chongming Island

Our empirical findings are presented in three sections. The first subsection recounts the appearance of the sandbanks that later formed the geological basis of Chongming Island during the seventh century. It recalls the arrival of humans and reeds on Chongming and discusses the century-long dependence of local livelihoods on reeds and the wetland ecosystem. The second subsection explores the destruction of coastal wetlands and the reed community due to massive land reclamation activities since the 1950s. Land reclamation projects have exploited the original coastal landscape for the purposes of industrialisation and urbanisation and nearly wiped out the coastal reeds on Chongming. Surprisingly, land reclamation activities even continued on in a nature reserve after the announcement of the "Eco-Islands" plan. This was justified as a necessary measure for treating an invasive grass species, even though the grass had originally been introduced in order to facilitate land reclamation. The third subsection looks at the destruction of reed environments along numerous rivers on the island due to river regulation measures implemented under the banner of the Eco-Islands development. While a series of river rectification projects were enacted to actively reconstruct riverine landscapes on Chongming as part of the Eco-Islands development, they actually hastened the disappearance of the reeds, thereby further separating local residents from this native plant species and its associated ecology.

4.1 Reed lands of plenty

The history of the reeds starts with the formation of Chongming Island. In the early seventh century, the interaction between the Yangtze River and the sea created two sandbanks that later became Chongming Island.[2] Reeds spontaneously grew on these sandbanks and attracted the first group of human settlers (Song, 2005). The earliest written records of human activity on these sandbanks date back to 696 AD, as fishermen from the adjacent region visited the area for fishing and reed harvesting (Chongming County Chorography Compilation Committee, 1989). Since then, the life of people on Chongming has been entangled with the reeds.

From the eighth to the fourteenth century, sandbanks continued to emerge, growing as a result of natural processes of sediment deposition by the Yangtze River. They were scattered and unstable in their size and location (Wu et al., 2019), and for a long time, soil on these sandbanks was salty and not arable. Yet it was suitable for growing reeds and producing salt. Consequently, alongside the salt industry, reeds have long been a main source of income for inhabitants on Chongming.[3][4] A historical account that focuses on the years 1234 to 1264 in the Yuan Dynasty records that the two big imperial

[2] *Wanli Chongming County Chorography Evolution*, published in 1605.
[3] *Zhengde Chongming County Chorography*, published in 1520.
[4] In the imperial past, salt industries were monopolised by the imperial court. Common people thus relied heavily on reeds.

manors on Chongming—the *Jianghuai Yongfeng Zhuang* and the *Jiangzhe Baocheng Zhuang*—paid a huge amount of reed taxes, which accounted for the vast majority of Chongming's total tax revenue (Mao et al., 2016). Predictably, reed harvesting and processing were the most important part of Chongming's economy during that period.

As the course of the Yangtze River changed throughout time, the soil on Chongming gradually desalinated, allowing the development of a moderate amount of agriculture. While crop production continued to rise, reeds continued to thrive on the island, supporting the everyday life of Chongming residents.[5] During the Qing Dynasty (1636-1912), late autumn and early winter were called *Chaixun* (literally "Firewood Season"), as dried reeds were harvested during this period.[6] Besides collecting reeds that grew wildly on the coast, local people also started planting reeds for the purposes of accelerating desalination and consolidating mudflats, which enabled subsequent crop cultivation.[7] Most of the land on Chongming has thus been through a process of transformation, from grass flats to reed marshes, and eventually to fields that were fit for growing crops (Song, 2005).

Reeds also supported construction and architecture on Chongming, shaping local livelihoods and culture. Reeds have long been one of the raw materials used in building construction and in craftsmanship since other building materials, such as rocks and wood, were scarce on the island. Dried reeds (locally known as *Luchai*) were woven or piled together to form walls, roofs, and fences of relatively simple thatched huts. They were also made into various objects, such as mats, brooms, dustpans, curtains, and shoes,[8] as well as children's toys, such as *Yaozi* (kites), *Ludi* (reed flutes) *Luye laba* (reed leaf trumpets), reed windmills, frogs, birds, and boats (Xu & Wu, 2007). Historical accounts document that during the period of the Republic of China (1912–1949), these reed products were even sold outside of Chongming, bringing in additional income for the residents of Chongming.[9] Beyond this, the remnants of harvested reeds found along the ditches of the island were the preferred feed for cattle.

Reeds were also an integral part of local folk customs.[10] For example, in the evening of the Spring Lantern Festival on the fifteenth day of the first lunar month, a ritual ceremony called "*Guan Tiancai*" was held on Chongming, in which young men and women would dance and swing the ignited reed torch around their farmlands while chanting their wishes for prosperity in the coming year. The reed

[5] *Zhengde Chongming County Chorography*, published in 1520. Chapter 3 – Customs. Dried reeds trading, together with cloth dyeing and garlic planting, supplemented crop industries in constructing the local economy.
[6] *Yongzheng Chongming County Chorography*, published in 1727. Chapter 4, Customs.
[7] *Kangxi Chongming County Chorography*, published in 1684; and *Minguo Chongming County Chorography*, published in 1924. The activity of planting reeds is locally known as *Zhongjing*.
[8] Reed mat making has been recorded in *Zhengde Chongming County Chorography*, 1520. Chapter 3 – Customs.
[9] *Chongming County Chorography Draft*, published in 1960.
[10] Sources about Chongming traditional folk customs are gathered from *Minguo Chongming County Chorography,* published in 1924, Chapter 4; Xu & Wu, 2007; and Xu, 2009.

torch was often made by wrapping dried reeds around a reed rod and then tying it with a straw rope. During summer, especially during the Dragon Boat Festival on the fifth day of the fifth lunar month, local residents would collect reed leaves from the riverside or near the coast to make a traditional food eaten at festivals—*Zongzi*—a glutinous rice dumpling. Reeds were also used in traditional funeral customs. Unlike the majority of rural areas elsewhere in China, land on Chongming was extremely unstable due to constant erosion through the tides; it was therefore unable to be used for burial practices. Cremation thus has a long tradition on Chongming, with local people using reed mats to cover the deceased before cremation.[11] Even today, some local people still maintain the tradition of weaving reed items (such as miniature houses, luxury cars, and electrical appliances) and burning them as offerings for deceased family members.

Reeds also have a strong presence in Chongming's folk ballads, legends, and proverbs. As an essential part of local people's livelihoods throughout history, the reed has become a symbol of the spirit of Chongming. As a popular proverb says, "*Dang li lu qing bu pa feng, pao tan ren bu pa qiong,*" which means fishermen would never be afraid of poverty, just as the reeds in the marshes would never yield to the wind. Reeds have symbolised the strong will and indomitable vitality of the people of Chongming and are cherished by generations of Chongming residents even today. However, along with the effects of industrialisation and urbanisation in contemporary times (as discussed below), reed ecology on Chongming continues to suffer.

4.2. Coastal reeds decimated by land reclamation projects

Population growth since the 1950s has intensified human activity on Chongming, as with other areas across China. Along the Island's coastline, the two most evident impacts of industrial activity are the reclamation of land and the construction of sea walls. Increased engineering works have resulted in substantial landscape change along the shorelines (Wu, 2016; Zhou, 1999). The original coastal wetland ecology has been gradually replaced by concrete structures, leading to the gradual extinction of the reeds, as well as many other wetland plants and aquatic species.

In their natural state, coastal wetlands are in a dynamic state of evolution that follow a process of deposition, siltation, maturing, and ageing. Through this process, subtidal areas are gradually turned into intertidal and supratidal zones, eventually becoming land (Yuan et al., 2002). In the meantime, new subtidal areas are formed, with this dynamic process starting over once again. Throughout the history of Chongming, water management and coastal construction has been a priority for local

[11] *Zhengde Chongming County Chorography,* 1520. Chapter 3, Custom.

officials of all generations in order to prevent flooding and ensure safety and an ongoing livelihood for local inhabitants.[12] Numerous dykes and dams were constructed over time in order to protect the island against salty tides and stormy seas. Inside the levees, people grew reeds to consolidate the soil and channel the river water into the hinterlands to develop agriculture. However, due to their small scale and insufficient protection, such sand islands often collapsed during typhoons and storm surges (Wu et al., 2019). From 1917 to 1948, there were 17 land reclamation projects recorded on Chongming, with a total of 6000 mu (4 km^2) of land reclaimed (Chongming County Water Affairs Bureau, 1987). Despite the land reclamation projects conducted during this period, there is no evidence of a decrease in the production of reeds, as reeds still accounted for a significant part of the local economy.[13] This demonstrates that as long as land reclamation did not exceed the natural growth of the wetlands, the coastal ecosystem remained in a state of dynamic balance (Wu et al., 2019), continuing to support native animal and plant species, including the reeds. However, such balance can be deeply disturbed if unbridled land reclamation projects include the reclamation of supratidal, intertidal, and subtidal areas, with reeds usually growing in the latter two zones. When natural wetland growth cannot keep pace with human-induced wetland loss, wetlands gradually diminish, resulting in a loss of their ecological services.

The first major decline in the reed landscape on Chongming resulted from a series of large-scale land reclamation projects organised by the state in the late 1950s. The establishment of the PRC in 1949 was followed by increased demand for agricultural land to feed the country's burgeoning population and support the new state's ambition for rapid industrial and urban development. Wetlands along coastal areas became the primary target for land creation projects. Embracing the state's call to wage a "war against the earth" and "turn empty lands into an earthly paradise" through agriculture (Yeh, 2009a), massive land reclamation projects were carried out along the coast to transform "wastelands" into arable farmlands. The first systematic and large-scale land reclamation project started on Chongming in 1955, with a total of 8.27 km^2 of land established in the north-eastern part of the island, which was over twice the size of the total land reclaimed between 1917 and 1948. In 1958, Chongming County was re-assigned by the central government to the jurisdiction of the municipality of Shanghai. This decision aimed to enlarge the suburban area of Shanghai to enable adequate food production to support the city. Therefore, extensive land reclamation projects followed shortly after based on the municipal government's determination to "transform the reed and grass marshes on Chongming into the city's food supply base" (Xu, 2013). Statistics show that from 1955 to 1984, Chongming County

[12] *Minguo Chongming County Chorography*, 1924, Chapter 4. Chongming County Chorography, 1989, Chapter 12.
[13] *Chongming County Chorography Draft* published in 1960.

organised a total of 55 land reclamation projects, and about 408 km^2 of land was reclaimed from the sea (Chongming County Chorography Compilation Committee, 1995).

Since the implementation of economic reforms and the opening up of the PRC to global markets in the late 1980s to support rapid economic development, the reclamation of coastal areas has continued apace, involving a massive area of land (Lotze et al., 2006). Chongming, as the rural outskirts of the megacity Shanghai, has unsurprisingly been at the forefront of land creation projects. From 1985 to 1994, 12 reclamation projects were enforced on Chongming, creating about 91.5 km^2 of land (Chongming County Chorography Compilation Committee, 1995). In 1999, the successful completion of a 6,500-metre levee in the north-western part of the island added another 10 km^2 of land to the jurisdiction of Chongming and Shanghai (Shanghai Agricultural Reclamation Records Compilation Committee, 2004).

Attempts to reclaim land throughout the past six decades have doubled the size of Chongming Island, with the area of Chongming having grown from about 600 km^2 in 1949 to the current 1,267 km^2 (Xie et al., 2019a; Wu et al., 2019). A remote sensing analysis of land use/cover change of the eastern part of Chongming reveals the extent to which local vegetation has changed. Despite some growth in the land covered by reeds between 1985 and 1989, the total area of land occupied by reeds continued to decrease between 1989 and 2013. In the years 1989, 1995, 2002, 2004, and 2013, the area of land occupied by reeds accounted for 6.956%, 5.865%, 2.187%, 2.035%, and 1.814% of the area covered in the study (Xie, 2016). Further analysis has shown that the total area of land occupied by reeds has decreased from around 25.43 km^2 in 1985 to about 12.25km^2, of which 70.924% was transformed into agricultural land and 18.179% into land for aquacultural use (Xie, 2016). A similar decrease has been seen in other dominant species that inhabit the Chongming wetlands—the area of land occupied by *Scirpus mariqueter,* for example, decreased from 7.594% in 1985 to 1.67% in 2013 (Xie, 2016).

Whilst it was expected that the Eco-Islands plan developed in the early 2000s would place the environment at the centre of plans for Chongming's development, environmentally destructive land reclamation projects did not stop. Instead, efforts to reclaim land continued even in a well-defined natural conservation area. In the year 2000, local governments in coordination with developers introduced the species *Spartina alterniflora* Loisel to promote the silting process used to reclaim land in the eastern part of Chongming. This non-native plant species was well adapted to the eutrophied waters of the Yangtze Estuary and thus rapidly spread, which further accelerated the loss of the reeds and other indigenous plants, such as *Scirpus mariqueter*, from Chongming (Mao et al., 2017; Yuan, 2018). Ironically, the existence of this deliberately introduced "land reclamation helper" (*Spartina alterniflora)* served as an argument for further land reclamation projects in the Dongtan Natural

Reserve situated along the eastern coastline of Chongming. After the announcement of the Eco-islands plan, land reclamation was used as a method to curb the spread of this invasive plant species.

Continuous reclamation activities resulted in the disappearance of large areas of high tide vegetation habitats. The adoption of reclamation as a method was neither ecological nor particularly effective (Yuan, 2018). In fact, its application in the early period of eco-development on Chongming Island demonstrated a lack of genuine ecological thinking. In subsequent periods physical or mechanical methods (such as cutting plus waterlogging) and biological methods (e.g., using environmentally friendly herbicides) were introduced by ecologists in an attempt to gain control of invasive *Spartina alterniflor* (Zhao et al., 2020), but in the early years, local practitioners lacked ecological knowledge about the spread of invasive grasses. The unintended consequences of planting an invasive grass were in the end, we argue, instrumentalized for an ecological modernization-agenda on Chongming. Seeking to combine ecological development and environmental improvement with modernizing strategies, the ecological modernization ideal entrenched in Chinese eco-development adopts an overly anthropocentric version of the environment. It marginalizes ecological processes in nature while it privileges economic growth pursuits. In the end, ecologically destructive reclamation activities were legitimized, and used to cement and justify modernization-oriented eco-development.

4.3 River reeds wiped out by eco-construction projects

The reeds growing inland on Chongming were in most cases fortunate enough to avoid the catastrophic destruction caused by coastal land reclamation projects. However, they have nevertheless fallen victim to the eco-development movement in the wake of the construction of the Eco-Islands project. As discussed at the beginning of the paper, state-led eco-development in China is mainly driven by a narrow ideology of Ecological Modernisation, which not only believes economic advancement can address environmental problems, but also privileges technological and engineering solutions (Muldavin, 2013). The top-down mechanisms inherent in these eco-developments led to the implementation of a series of river regulation projects (Xie et al., 2019a; 2019b), which instead of improving river ecosystems gradually destroyed them, wiping out the reeds and other indigenous plants and animals living in and near to the numerous rivers on the island.

Chongming Island is essentially a large estuary wetland. Generations of residents on Chongming have created a crisscrossing network of waterways that bring water into the hinterlands to desalinate the soil and irrigate the crops in the fields (Wei, 1983). Statistics show that by the end of 2012, the island had a total of 15,923 rivulets and ditches, running a total of 935,230 kilometres (Chongming County Water Affairs Bureau & Marine Bureau, 2014). Maintaining the health of this vast number of waterways is key for agricultural activities and for people's daily livelihoods. Water management is

therefore undoubtedly an important part of the overall Eco-Islands plan. Under Shanghai Municipal Government's direct instructions, the then Chongming County Government (now Chongming District Government) started the first of a series of river regulation projects in 2006. The so-called "Ten-Thousand River Regulation Operation" (*Wan He Zheng Zhi Xing Don*) was jointly issued by the Chongming Water Authority and the Chongming Finance Bureau in November 2006, involving nearly 5,000 rivers and ditches on Chongming. Following this, in 2009, the "Village and House River Regulation" (*Cun Gou Zhai He*) was further enacted, which involved the modification (or so-called 'upgrading') of more than 4,000 village ditches on Chongming. Since 2011, another series of projects, including "Ecological River Regulation" (*Sheng Tai He Dao Zheng Zhi*), "Medium and Small River Maintenance" (*Zhong Xiao He Dao Yang Hu*), and "Village-Level River Dredging" (*Zhen Cun Ji He Dao Lun Shu*), have been launched and implemented.

These projects should have resulted in substantial improvements to water quality on the island. However, interviews with local residents and our on-site field surveys indicate that despite their intention to treat water pollution and improve water quality, these operations had severe adverse effects on the ground. One local resident, who is also a locally active environmentalist in Hongqiao Village, expressed her observations and criticisms:

> From what I observed and experienced, Chongming has suffered the worst ecological transformation in the past ten years. Those ecological projects enforced by the government are actually destroying our ecology day by day. The most severe problem is the river regulation projects. Projects intended to improve rivers and riverbanks adopted conventional hardening techniques, cementing the original natural riverbank with an impermeable concrete retaining wall, which cut off the exchange of material, energy, and information between rivers and the banks, and thus disabled the rivers' self-purification abilities. Meanwhile, as the village sewage treatment system has not been improved, the quality of processed wastewater that is directly emitted into the rivers is very low, which profoundly threatens the river water environment. Consequently, rivers on the Island are persistently polluted, which poses grave harm to aquatic organisms and further induces biodiversity loss.[14]

The residents' narratives highlight the intentions of the Chongming Eco-Islands' policies and plans, which emphasised a technical and engineering approach (with consequent marginalisation of local knowledge and expertise) (Xie et al., 2019b) and valued resource efficiency (e.g., in land use and water flow) and urban aesthetics (e.g., in landscape design) (Pow, 2018). Photographs provided by a local

[14] Interview with a local resident, also an environmental activist on 13 Feb. 2017.

resident recorded a village ditch before and after river rectification, vividly demonstrating the destructive results (Figure 3). With the marked visual change came the disappearance of the reeds and the original river ecology. On-site surveys enabled the authors to empathise with the residents' concerns, as we documented the transformation of a river alongside the Xinjiang Road before and after the river regulations were implemented (Figure 4). After more than a decade of rectification works, nearly all rivers and ditches on Chongming Island have been cemented and elaborately trimmed, changing the island's river landscape and ecology and decimating reeds on the riverbanks.

Figure 3. A village ditch on Chongming before and after the river regulations were implemented

Source: A local resident of Hongqiao Village on Chongming

Figure 4. Transformation of the riverbank on Xinjiang Road as a result of a river rectification project from 14-11-2017 to 29-03-2018

Source: Authors

Changing river and riverbank governance practices provide some cues as to why projects that were initiated to improve water systems on Chongming ended up degrading them. For most of Chongming's history, water conservation and management were mainly conducted by local residents on Chongming (Chongming County Chorography Draft, 1960; Chongming County Chorography Compilation Committee, 1989). Before 1949, regular maintenance of arterial rivers (mainly annual dredging) was conducted by local communities or local administrators, with project costs shared by either communities or beneficiaries. Secondary rivers and ditches were looked after by local farmers based on their own initiative. Government involvement was very limited. A similar mode of self-governance continued in the "peoples' communes" (*renmin gongshe*) period (1958–1984). Under the peoples' communes system all activities, including economic production, such as farming, social affairs, and accounting, was conducted on two levels. The production team (*shengchan xiaodui*) consisted of a few dozen to over a hundred farmers or workers, whereas the production brigade (*shengchan dadui*) involved the entire village (divided into small teams of five to ten).

During the peoples' commune period, a series of river dredging and remediation projects were carried out on the island by the production brigade, whilst the management and maintenance of numerous small rivers and ditches was organised by local production teams. An elderly indigenous farmer recalled the annual ditching and dredging:

> Guaranteeing the water flow is very important. Our crop fields rely on it, and we need clean water for cooking and for washing. Every year or every two years, the production team organised people to conduct ditching and dredging. Each household would send one or two people to join the team. Besides dredging the silted riverbed, we also reaped the reeds, which we then used for firewood or handcrafts.[15]

Maintaining the watercourse was of great importance for local livelihoods and food production, and it remained so even after 1984 when the people's commune system was abolished across the country. While decollectivization swept across the country, including in the southwest as noted by Muldavin (2000), the situation in Chongming Island was different. Here local residents tended to rivers and riverbanks even after 1984. Production teams organised traditional annual maintenance; activities included river dredging and the harvesting of reeds. Riverside lands near villagers' houses were (informally) allocated to individual households for management and maintenance.[16] This was mostly due to the largely rural character of Chongming. People on Chongming depended on farming for their livelihoods, and the maintenance of healthy rivers was critical for communities and households. It was

[15] Interview with an indigenous farmer on 19 Jun. 2018.
[16] Interview with an indigenous farmer on 19 Jun. 2018.

also the result of a strong emotional attachment of Chongming farmers to the riverbanks they had managed for many generations. In an interview with a village elder, we were told that often villagers planted trees or vegetables on the riverbank, which they did for personal reasons, as emotionally expressed by one resident:

> [The riverbank you managed] shows the characteristics of your family—if your vegetables or plantings are growing very well, the neighbours will praise you; and if not, then people might think you are not industrious or not skilful.[17]

However, the series of arbitrary river regulation projects implemented by the government has separated local residents from their immediate natural living environment. This again demonstrated the Ecological Modernisation thinking of Chongming's Eco-Island development, which harbours a distrust of the public to make key environmental management decisions (Muldavin, 2013), or even to act favourably to the environment. All rivers on the island, whether small or large, were put under unified management by the water authority. Some residents were employed by the government to carry out project work, but they were no longer in charge of their own local areas. For example, in 2006, the Chongming Water Authority employed hundreds and thousands of "river cleaners" to manage rivers of all kinds. Their main tasks included watercourse cleaning for which they were given rigorous instructions.[18] A former "river cleaner" hired in 2007 describes his job below:

> I am part of the first batch of river cleaners on Chongming. I remember each river cleaner was allocated an 840 metre long river section, and the main requirements included cleaning the water, clearing all kinds of [fishing and fish-farming] cages and fast-growing aquatic plants to ensure a smooth flow of the water, and removing all reeds, wild rice shoots and any other plants on the river banks within a year. No plants were supposed to be found within 50 centimetres below the water surface. There were monthly inspections and failure to fulfil the task would lead to salary deductions, which was often quite a lot. To accomplish the job, we used herbicides to clear the riverbanks. So, we are actually the 'reed killers'.[19]

A lack of scientific understanding of the disastrous effects of herbicides, along with the need to be rigorous in order to retain their full salary, made the work of the cleaners highly destructive in ecological terms. The river regulation project included the removal of all reeds and other aquatic riverside plants. This led to a complete reversal of the work that county governments had previously instructed local communities to do. During the 1970s and 1980s, reeds had been planted as a major

[17] Interview with a local resident, also an environmental activist on 13 Feb. 2017.
[18] Interview with officials from Chongming Water Authority on 18 Jun. 2018.
[19] Interview with a local "river cleaner" 12 Sep. 2018.

measure to protect river slope collapse (Chongming County Chorography Compilation Committee, 1989).

Similar demands can also be seen in the "River Leader System" (*Hezhang Zhi*) initiated in early 2017 on Chongming.[20] The Chongming River Management Office appointed "river leaders" for each river on the island (normally held by a town cadre and the village head). The task of the river managers is clearly stated on the orange billboards put up next to each river on Chongming Island. They state what is not permitted: "*no crops in the streambanks and riverbanks, no illegal construction, no piles, no garbage, no fallen trees, no flotsam and jetsam on the river surface, no obstructions to the river channel, no illegal emissions, no withered plants in and by the river*." Considering the quick response of local officials to instructions coming from higher levels of government, local cadres and river managers pursued the most efficient solutions that could generate rapid and visible effects (similar to the river cleaners' adoption of herbicides), including cementing the riverbank. Biodiversity and ecology were not part of the river assessment and thus not considered by local government officials. Such divergence between the intention of environmental sustainability and the destructive outcome of eco-developmental intervention has also been revealed by other scholars, such as Muldavin (2013) and Yeh (2009b). The case of Chongming river regulation is a prime example of intrinsic limitations of current Ecological Modernisation-development in China. Challenges and problems that result from this approach are due to the top-down character of intervention and management, to the call for quick and quantifiable results, to the preference that is given to technological and engineering solutions, and to the negligence of local impacts, both on residents and ecologies.

Today, the renowned "eco" brand of Chongming has attracted tourists who are seeking a getaway from busy city life. Among numerous attractions on the island, the Dongtan Wetland Park and the Xisha Wetland Park are the most popular destinations. The vast expanse of planted reed marshes in these two constructed wetland parks position tourists within a rural and 'natural' atmosphere. They are also popular as a setting for Chinese movies and TV series, where they are used for depicting scenes of romance and pristine rural nature.[21] However, what seems like a "natural" wetland landscape is nothing of the sort. Rather, local communities on the island bemoan the disappearance of the reeds from the Island and the consequent transformation of the local environment. "In the past, reeds were all over Chongming. But now, we can only see them in the wetland parks," explained one local farmer

[20] The "river leader system" was introduced by the Chinese government to tackle the difficulties of transboundary water governance. By assigning higher-ranking government officials to take responsibility for a specific river, the river leader policy mobilises administrative resources among various territories within a transboundary river basin (namely, the river leader can command officials in each subordinate territorial administrative area to practice river governance). For further discussion of the Chinese "River Leader System," see Chien and Hong, 2018.

[21] For example, "My Splendid Life" (*Wo De Can Lan Ren Sheng*) (2011), "Boss & Me" (*Shan Shan Lai Le*) (2014), "Promise of Migratory Birds" (*Shi Wu Nian Deng Dai Hou Niao*) (2016), and "Negotiator" (*Tan Pan Guan*) (2017).

in a sad tone of voice.[22] Such sadness and lament were echoed by many local people during our field surveys. Other typical comments included:

> Before the Eco-Islands construction … reeds could be found all over the banks of the rivers. The river water was very clean and had a variety of creatures, such as fish, shrimp, crabs, and eel. That was the natural 'eco', but unfortunately it does not exist anymore.[23]

> In the past, the river in front of our house was very clean. Every family went there to wash rice, vegetables, and sometimes clothes. At that time, the riverbanks were covered by reeds, and crabs and fish were abundant in the river. So, in the summer, children were playing in the river, swimming and trying to catch fish or crabs. Now, the river is not as clean as it used to be, and no one uses it anymore.[24]

5 Conclusion

Today, with the grand vision to build an Ecological Civilisation, experimental eco-developments of different sizes are on the rise all across China. These projects are all initiated under the banner and promise of a balance between economic growth, environmental protection, and social progress. Nevertheless, our story of the disappearance of an indigenous plant— reeds—on Chongming, an island that was part of the grand Eco-Islands plan, reveals the paradox of ecological destruction through the high-flown goal of eco-development. The transformation of reed landscapes on Chongming mirrors wider environmental changes on the island, as well as the political and economic dynamics underlying local eco-developments. In this case, the near extinction of the once abundant reeds in the coastal wetlands due to massive land reclamation projects shows the pernicious effects of the persistent pursuit of economic development. Ironically, the adoption of an ecological development agenda did not put an end to ecologically destructive land reclamation projects on Chongming. Instead, land reclamation continued, even in natural reserve areas, where it was conducted under the pretext of removing an invasive plant species, which was once purposely introduced to the island to facilitate land reclamation. Moreover, reeds that once grew by the rivers on Chongming were gradually wiped out by "ecological" river regulation projects. A historical perspective of Chongming can therefore serve as a reminder that truly environmentally conscious developments should not ignore traditional ecological knowledge. Eco-projects on Chongming have blindly worshipped modern technological and engineering solutions, which privilege measurable targets, such as the number of rivers that have been canalised. The message is sobering. It alerts policy-makers, planners, and practitioners to the fact that

[22] Interview with a local farmer on 29 Aug. 2017.
[23] Interview with a local farmer on 13 Feb. 2017.
[24] Interview with a local farmer on 29 Aug. 2017.

well-intentioned ecological initiatives can in fact have destructive effects if the locality, its ecological features, cultural characteristics, and historical and social context are not fully considered.

Our case study of the reeds on Chongming Island also shows that an environmental microhistory approach can be extremely useful for evaluating contemporary eco-developments. With its diachronic focus, environmental microhistory contributes a temporal perspective that enables a critical and longitudinal evaluation of the effect of eco-initiatives on local communities and their environments. It also enables a deep 'on-the-ground' understanding of complex political, socio-economic, and environmental dynamics. Moreover, the application of environmental microhistory in the study of ecological development enriches the domain of broader environmental history, strengthening its "practical" attributes. As we have shown, the history of the local environment and its interaction with local residents can inform the characteristics of the natural ecology of a site, as well as traditional knowledge and culture, which are deeply intertwined with environmental management. This rich source of knowledge should be taken into account in view of future ecological development plans. Environmental history drew its initial momentum from widespread ecological concerns; in this respect, it lends itself to critical evaluation and adaptation to many eco-developments in China.

Lastly, it also becomes apparent from our study that it is of vital significance to build intellectual bridges across disciplines—between historians, ecologists, planners, policy-makers, and local communities. Breaking down intellectual and institutional silos will not only advance the field of environmental (micro)history and urban sustainability but also help to counter the often grim realities of current eco-development projects by promoting more locally-responsive, environmentally-friendly, and socially just developments. Local residents on Chongming Island have for a long time relied on the environment for their livelihoods and have consequently formed a strong connection with the island's natural ecologies. Reeds, as an indigenous wetland plant species, have been cherished and widely used by community members. Nevertheless, planning experts and policy-makers responsible for river rectification works were primarily trained and equipped with urban environmental management skills and techniques that focused on aesthetic and economic concerns rather than socio-environmental considerations. Consequently, local knowledge of Chongming has been marginalised and the lessons gained from a long-term human-nature relationship have fallen by the wayside. The rhetoric of an Ecological Civilisation has put the environment at centre-stage, yet its application in planning and governance is still lagging behind. In light of urgent global climate and biodiversity challenges (Clarke et al., 2014; Díaz, S. et al. 2019), historically-informed and environmentally sensitive planning is needed in order to truly fulfil the promises of China's ecological agenda.

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